

Course Number	CS 510	Course Title	Wireless and Network Security				
Semester Hours	3	Course Coordinator	Koushik Sinha				
		FA20					
Catalog Description	Advanced security concepts of distributed systems and wireless networks are presented. Topics include IEEE 802.11 security, Wireless Encryption and Authentication, Key Management in Networks, Distributed Denial of Service Attacks, Routing Security, Intrusion Detection and Mobile Code Security.						
Textbooks							
Earle, A. E. (2005). <i>Wireless Security Handbook</i> . Auerbach Publications.							
Xiao, Y. Du, D-Z., & Shen, X. (2006). <i>Wireless Network Security</i> . Springer-Verlag.							
References							
Course Learning Outcomes							
<ul style="list-style-type: none"> • To introduce the principles, mechanisms and implementation of security in distributed systems. • To provide a thorough coverage of the up-to-date wireless encryption and authentication protocols. • To introduce the details of distributed security attacks and how to detect and handle such attacks. • To have students gain hands-on experience with programming techniques for wireless security protocols. 							
Assessment of the Contribution to Student Outcomes							
Outcome →	1	2	3	4	5	6	7
Assessed →		X	X		X		
Prerequisites by Topic							
CS410 with a grade of C or better or consent of the instructor.							

Major Topics Covered in the Course

1. Introduction
 - Wireless Basics
 - Review of Characteristics of Wireless Networks
 - Review of Routing in Wireless Networks
 - Review of IEEE 802.11 and Bluetooth {3 classes}
2. Wireless Encryption and Authentication
 - Review of Security Basics
 - WEP, WPA, WPA2
 - IEEE 802.11x, IEEE 802.11i, VPN over Wireless , RC4, RC5
 - Bluetooth Security
 - Encryption and Authentication in Wireless Sensor Networks {10 classes}
3. Key Management
 - Key Management in Wired Networks
 - Key Management in Wireless Networks {9 classes}
4. Distributed Trust
 - Trust Models in Distributed Systems
 - Reputation based Trust
 - Recommendation based Trust {3 classes}
5. Routing Security
 - Routing Security Attacks
 - Routing Security of Internet / BGP
 - Routing Security of Mobile Ad Hoc Networks
 - Routing Security of Wireless Sensor Networks {9 classes}
6. Intrusion Detection
 - Intrusion Detection in Wired Networks
 - Host-based and Network-based IDS
 - Intrusion Detection in Wireless Networks {6 classes}